Remarks

The Applicants have amended the specification in a number of locations to correct typographical errors, particularly with respect to "perlite."

The Applicants have also amended Claims 7, 9 and 15 to recite that the steel article has "uniformly elongated" soft ferrite. Support may be found throughout the Applicants' substitute specification such as in paragraphs [0048] and [0052], for example.

Claims 7-9 and 15-17 stand rejected under 35 USC §103 over Toyooka. The Applicants note with appreciation the Examiner's detailed comments hypothetically applying Toyooka against those claims, including the "Response to Arguments" comments. The Applicants disagree with the applicability of Toyooka and respectfully submit that it is inapplicable for the reasons set forth below.

The Action on page 9 acknowledges the Applicants' prior points that the methodology of the Applicants is different from Toyooka and this results in a different microstructure. In particular, the Applicants' methodology results in uniformly elongated and isotropic grains as opposed to the unevenly elongated grains of Toyooka. In other words, the Toyooka grains are elongated in the L direction, but not in the C direction. On the other hand, the Applicants' grains are uniformly elongated or "equiaxed" as noted in the Official Action.

In that regard, the expression "uniformly elongated" could possibly be confused with "uniform elongation" used in tensile tests. Hence, the Applicants refer to "uniformly and isotropic elongated" in this response.

Portions supporting "uniformly and isotropic elongated" are found in the Applicants' specification. In particular, paragraph [0052] recites "in view of a low YR and uniform elongation, final rolling is preferably finished at a temperature of 800°C or more so that a working strain is not allowed to remain." That is to say, 800°C or more corresponds to the transformation point Ac_3 in the attached diagrams.

In addition to the foregoing, paragraph [0053] states: "Furthermore, even when the rolling finish temperature is set to 800°C or more in pipe forming, non-uniform and anisotropic material properties may be generated depending on a manufacturing process in some cases, and in this case, normalizing treatment may also be performed whenever necessary. In the range of the composition according to the present invention, although a microstructure obtained after normalizing treatment (cf. the 2nd reheating shown on the right-hand side in the lowest process

diagram of the invention of the present application) is approximately equivalent to that of a microstructure obtained right after pipe forming, the non-uniform and anisotropic material properties generated in pipe forming are decreased, and as a result, a more superior pipe-expansion property can be obtained."

It can thus be understood that with the Applicants' steel, the non-uniform and anisotropic material properties are reduced. In other words, the non-uniformity and anisotropic aspects of elongation are decreased. Therefore, the Applicants' steel pipe is "uniformly and isotropic elongated."

It should be noted that "uniformly elongated" is not identical to "uniform elongation" used in tensile tests. The uniform elongation in a tensile test means a threshold limit value of permanent elongation wherein a parallel portion of a test specimen uniformly deforms. A threshold limit value is obtained usually as permanent elongation corresponding to a maximum tensile load. The expression "uniformly and isotropic elongated" thus means that the elongation, in the longitudinal direction (D direction) of a steel pipe and in the circumferential direction (C direction) of a steel pipe, is uniform and the steel pipe has no anisotropic aspect.

In any event, the Action also observes that the "equiaxed" aspect was not claimed. The Applicants have accordingly amended independent Claims 7, 9 and 15 to include this important feature. Particularly, as noted above, the Applicants claims now specify that the steel article has a "uniformly elongated" soft ferrite. Referring to the Applicants' last Response dated March 3, 2010 and the drawing attached to that Response, the top half of the drawing refers to Toyooka where there is non-uniform elongation. In other words, there is elongation in the L direction, but no elongation in the C direction. This is reflective of a "non-uniform" elongation. In sharp contrast, the Applicants' independent Claims 7, 9 and 15 specifically recite uniformly elongated soft ferrite wherein there is uniform elongation in both the L and C directions.

These differences are brought about by the different methods in which the respective steel pipes are produced. Again, referring to the previously submitted drawing, the comparison takes two seamless steel pipes having the same composition as claimed by the Applicants and subjects them to the Applicants' methodology on the hand and the Toyooka methodology on the other hand. Hence, the Toyooka seamless steel pipe is rolled at a low temperature which is less than the transformation point. On the other hand, the Applicants' seamless steel pipes are rolled at the transformation point or above. This causes the differences in the microstructure of the

respective pipes. In the case of the Toyooka pipes, the microstructure is non-uniformly elongated. This is shown in the top half of the previously submitted drawing. On the other hand, the Applicants' seamless steel pipes have a soft ferrite that is uniformly elongated and isotropic as shown in the lower half of the drawing. In other words, the Applicants' microstructure contains equiaxed grains while the Toyooka grains are not equiaxed.

The Applicants therefore respectfully submit that they have demonstrated that irrespective of any overlap in composition, there are critical differences in the methodology in forming the pipes which result in pipes having a different microstructure with respect to the shape of the grains. Of course, this impacts the resulting physical characteristics of the pipes. The Applicants also respectfully submit that the methodology of Toyooka would lead one skilled in the art away from the Applicants' claimed structure because of the above-mentioned differences in methodology. The Applicants therefore respectfully submit that they have fully demonstrated and now claimed the differences in processing method in the case of method Claim 15 and the resulting microstructure in all of Claims 7, 9 and 15. Withdrawal of the rejection is respectfully requested.

In light of the foregoing, the Applicants respectfully submit that the entire application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,

T. Daniel Christenbury
Reg. No. 31,750
Attorney for Applicants

TDC/vbm
(215)656-3381